R. H. DAY

PACIFIC SEABIRD GROUP



BULLETIN

Vol. 2 Spring 1975 No. 1


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PACIFIC SEABIRD GROUP

The Pacific Seabird Group (PSG) was formed in 1972 out of a need for better communication among Pacific seabird researchers. The Group acts to coordinate and stimulate the field activities of its members and to inform its membership and the general public of conservation issues relating to Pacific seabirds and the marine environment. Current activities include the development of standard techniques and reporting forms for colony censusing, pelagic observations and beached bird surveys. Policy statements are issued on conservation issues of critical importance. While the PSG's primary area of interest is the west coast of North America and adjacent areas of the Pacific, it is hoped that seabird enthusiasts in other parts of the world will join and participate in the Group. Annual dues for membership in the Group are $5.00 and are payable to the Secretary-Treasurer (address on back cover). Members receive the PSG Bulletin.

PACIFIC SEABIRD GROUP BULLETIN

The Pacific Seabird Group Bulletin is issued in the spring and fall of each year and contains news of interest to PSG members. Regional reports include a listing of current research and information on seabird conservation. The Bulletin does not act as an outlet for the results of scientific research but welcomes articles on seabird conservation, seabird research or other topics that relate to the objectives of the Group. Articles should be submitted to the Secretary-Treasurer. Back issues of the Bulletin (starting with spring 1974) are available from the Secretary-Treasurer for $2.50 each.

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Conservation

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PSG ANNUAL MEETING

The 1975 meeting of the Pacific Seabird Group will be held at Asilomar Conference Grounds in Pacific Grove, California (near Monterey) on 12-14 December. Further information will be sent to members in August.

PACIFIC SEABIRD GROUP BULLETIN

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THE CHAIRMAN'S PAGE

Over one hundred members attended our first meeting last December in Seattle. It was especially gratifying to see so many people at the meeting and to hear such a wide variety of topics presented in the general papers sessions. I hope that an even greater percentage of the membership will be able to attend in 1975.

In response to comments received during and after the meeting, the format for the 1975 meeting will permit more lengthy question and answer periods after each paper and also time for special interest groups to meet and discuss their shared interests and problems. In addition, it will be possible to present data in "poster sessions" which will allow individuals to present more detailed charts and graphs than could be done in the usual oral presentation. Details on this technique will be given in the 1975 call for papers. I hope that you will continue to give your input on meeting format so that the meeting structure will evolve into the form best suited to the special needs of our group.

I would like to take this opportunity to thank Dr. M. D. F. Udvardy, Mr. Gerald A. Sanger and Dr. Timothy Myres, outgoing Executive Council members, for their help in getting PSG through its first two years. They have all played a large role in the organization and promotion of our group and although they no longer serve on the Executive Council they continue to be active in PSG affairs.

We hope you will remember that the function of the Executive Council is only to play an administrative role in directing PSG activities. In order for the Pacific Seabird Group to continue to be a viable organization and to play a constructive role in the scientific community it is necessary for all members to contribute both ideas and energy. If we are to keep the world fully informed about Pacific seabirds, we must first of all maintain communication among ourselves. Let us hear from you!

J. Michael Scott

PACIFIC SEABIRD GROUP NEWS

Executive Council Elections

Elections must be held this year to choose 1976-1977 council representatives from British Columbia, Oregon and southern California, and to fill the three seats open to persons not living on the west coast of North America. Our present representatives from British Columbia and Oregon now live and work a long way from those respective regions. Elections are thus particularly important for members from those regions. Nominations or volunteerings will be open until 1 June 1975. Ballots will be sent out in June. We had very good participation in the last election. Let's do it again! David G. Ainley, Election Committee Coordinator, Box 8, Alder Rd., Bolinas, CA 94924.

Dues

For the past year and a half the PSG has operated on two grants from the National Audubon Society totaling $750 and a $200 grant from the Western Oil and Gas Association. The Group is deeply indebted for this support which has allowed the publishing of three Bulletins and the establishment of an organizational framework. So that the Group will be self-sufficient in the future, annual dues of $5.00 are being assessed beginning with this Bulletin. Persons paying their 1975 dues by September can be assured of receiving the fall number of the Bulletin and the announcement of the 1975 annual meeting. Prepayment of 1976 and 1977 dues will be accepted with the payment of this year's dues.

Structure of Executive Council Modified

At the annual meeting in Seattle the Executive Council voted to modify its structure so that areas away from the west coast of North America have more representation on the council. The eight regions of primary concern to the Group (Alaska, British Columbia, Washington, Oregon, northern California, southern California, Mexico, and Hawaii) will still be represented by single seats on the council. The non-Pacific U. S. and Canadian seats have been dissolved and the council will now have three "non-regional" seats open to anyone who does not live in one of the eight regions listed above. These changes have been incorporated into the bylaws that were distributed with this issue of the Bulletin. The Executive Council will now have 11 members. To fill the extra seat in the period prior to the elections the council has asked Haruo Ogi to serve on the council. Mr. Ogi has had a wide range of experience with Pacific seabirds and is a most welcome addition to the council.

Natural Resources Council Announces Symposium

The Natural Resources Council of America, the U. S. Department of the Interior, Fish and Wildlife Service, the National Audubon Society and the National Wildlife Federation are cosponsoring a symposium, "Conservation of Marine Birds in Northern North America An International Symposium", to be held in Seattle, Washington, 13-15 May 1975, according to Daniel A. Poole, Council Chairman. Other conservation groups, including PSG, have contributed to the planning of this meeting.

The objective of the symposium is to identify problems, basic information needs and action programs related to the conservation of marine birds in northern North America. The papers that are presented will later be published. Major topics that will be treated include: (1) socio-economic considerations of marine birds and their conservation; (2) the marine environment of birds; (3) status of marine bird populations on land and sea; (4) the biology and ecology of marine birds in the North; (5) conflicts between the conservation of marine birds and uses of other resources; (6) programs and authorities related to the conservation of marine birds; and (7) conservation of marine birds in other lands. More than 40 persons regionally and topically knowledgeable about these subjects will be participating.

The symposium will be held in the Seattle Hyatt House immediately adjacent to the Seattle-Tacoma International Airport. Persons wishing additional information should contact James C. Bartonek, Warren B. King, or David N. Nettleship, Cochairmen of the Planning Committee.

PSG Conservation Symposium Postponed

Due in large part to the symposium announced above, the conservation symposium planned for the 1975 PSG annual meeting has been postponed. The 1975 annual meeting will have a half-day session devoted to seabird conservation. Papers at the session will be in the same general categories as outlined on pages 3 and 4 of Vol 1., No. 2 of the Bulletin. Persons wishing to present papers at the session should contact Daniel W. Anderson, U. S. Fish and Wildlife Service, P. O. Box C, Davis, CA 95616.

International Seabird Meeting

During the 16th International Congress of Ornithology in Canberra, Australia, there was a meeting called by the Standing Committee for the Coordination of Seabird Research to discuss seabird matters on the evening of 15 August 1974. Sir Robert Falla of New Zealand, Dr. W. R. P. Bourne of

Scotland, and Dr. J. F. van Tets of Australia acted as chairman, secretary, and convenor, respectively. About 60 people attended. The topics discussed were: exchange of information, sea cruises, sea watches, realistic census figures, beach combings, wrecks, effect of anthropogene poisons, monitoring of index species and specimen banks. It was the general concensus of the participants that such regularly repeated censuses that are carried out with the aid of amateurs, e.g., sea watches and beach surveys, are very valuable tools in the long run giving information about the status or an index of seabird populations; their use should be encouraged in all coastal countries. Specimen banks are deep-frozen specimens properly stored, for the most part collected from beach wrecks etc., but also systematically. These would serve in the future as comparative material just as science today uses old egg collections for eggshell thinning studies or old preserved fish for mercury contamination studies. The participants unanimously passed a resolution that the Standing Committee passed onto the Congress for forwarding. This states that sea coastal countries should, through their appropriate agencies (museums, fish and game department, or others) establish data and specimen banks for seabirds. M. D. F. Udvardy.

Conservation Committee

To deal with the rapidly growing number of conservation issues relating to the marine environment a PSG Conservation Committee was formed at the annual meeting in Seattle. Membership is open to any person interested in seabird conservation who has the time and energy to devote to the committee's activities. If you are interested in being a member of this committee please contact the committee's coordinator Kenton D. Wohl at P. O. Box 1159, Anchorage, Alaska 99501. The primary functions of the committee are: (1) identify important seabird oriented conservation issues, (2) factually document the issues involved, (3) keep the general membership informed, and (4) prepare conservation policy statements for consideration and issuance by the Executive Council. People wishing to help the committee should send the coordinator information on conservation issues in their region. Documentation of an issue need be no more than a newspaper clipping.

Color-marking Schemes

In order to increase the number of returns to researchers color-marking seabirds in the Pacific and Atlantic, the Pacific Seabird Group will publish and regularly update a list of color-marking schemes involving seabirds. Anyone who is currently color-marking seabirds or has done so in the past is asked to send the following information to the Secretary:

Species
Type of marking: (bands, wing markers, streamers, etc).
Colors
Location of marking: which leg, wing, etc.
Banding location: country, state or province, specific location.
Name and address of person to whom details of sighting should be sent.

REGIONAL REPORTS

The following reports contain a listing of current and recently completed research. Persons knowing of additional research projects or conservation issues should contact the appropriate regional representative.

Alaska

Current Research

U. S. Fish and Wildlife Service (Aleutian Islands National Wildlife Refuge, P. O. Box 5251, Adak, AK 98791).

1. Aleutian Canada Goose restoration project. In its second year, this project will involve the release of captive-raised birds on Agattu Island and the continued study of the wild population breeding on Buldir Island.
2. Beach surveys. Four 1-mile segments of Bering Sea beach at Adak Island are walked regularly to provide baseline data on the natural mortality rates of seabirds and marine mammals.

   Principal Investigator for above two studies: G. Vernon Byrd.
3. Avifauna of Agattu Island. A general avifaunal survey, including location, size and species composition of seabird colonies.
4. Breeding biology and behavior of the Red-faced Cormorant.

   Principal Investigator for above two studies: John L. Trapp.
5. Avifauna of Buldir Island. A general avifaunal survey, including location, size and species composition of seabird colonies.
6. Breeding biology of Fork-tailed and Leach's Storm-Petrels at Buldir Island. Study to include breeding chronology and population estimates.

   Principal Investigators for above two studies: G. Vernon Byrd, Chris Dau and Matthew Dick.
7. Breeding biology and behavior of the Pelagic Cormorant.

   Principal Investigator: Matthew Dick.

U. S. Fish and Wildlife Service (Ecological Services, P. O. Box 1287, Juneau, AK 99802).

Southeast Alaska coastal foundation studies. Location and species composition of seabird colonies in the Alexander Archipelago are noted during the course of wildlife inventories.

Principal Investigators: Donald Montgomery and Ronald Berg.

U. S. Fish and Wildlife Service (Energy Delivery Systems, 813 D. St., Anchorage, AK 99501).

Seabirds of the Gulf of Alaska and Prince William Sound.

Aerial and at-sea observations are utilized to determine species composition, distribution and seasonal abundance
Principal Investigator: Robert T. Eberhardt.

U. S. Fish and Wildlife Service (Izembek National Wildlife Range, Pouch 2, Cold Bay, AK 99571).
The migration, mortality and reproductive success of the Black Brant. Reproductive success is studied on the Izembek Range when the entire population is present in the fall. Mortality and migration are studied along the entire migratory route.
Principal Investigator: Robert D. Jones, Jr.

U. S. Fish and Wildlife Service (Patuxent Wildlife Research Center, Laurel, MD 20810).
Eggshell thinning studies. Pacific seabirds being considered include: Fork-tailed Storm-Petrel, Leach's Storm-Petrel, Common Murre, Thick-billed Murre, Black Guillemot, Pigeon Guillemot, Ancient Murrelet, Cassin's Auklet, Parakeet Auklet, Crested Auklet, Least Auklet, Whiskered Auklet, Rhinoceros Auklet, Horned Puffin, and Tufted Puffin.
Principal Investigators: Erwin E. Klaas and Harry M. Ohlendorf.

U. S. Fish and Wildlife Service (Systems and Planning, 813 D St., Anchorage, AK 99501).
Inventory of seabird resources associated with the proposed Coastal National Wildlife Refuges in Alaska. The density and distribution of seabirds adjacent to proposed national wildlife refuges are being determined. The information will be used to guide legislative decision making in establishing the most biologically sound offshore refuge boundaries and to guide master planning for the proposed refuges.
Principal Investigators: David R. Cline and Edgar P. Bailey.

University of Lethbridge (Dept. of Colloquium Study, Lethbridge, Alberta T1K 3M4).
Nesting ecology of the Black Brant in Alaska. In cooperation with the U. S. Fish and Wildlife Service the normal behavioral response of the Black Brant to its breeding habitats is being studied on the Yukon-Kuskokwim Delta.
Principal Investigator: John Eisenhauer.

Conservation Notes

Alaska Considers Beaufort Sea Lease. The State of Alaska is considering an oil and gas lease in the Beaufort Sea to provide funds before the Trans-Alaska Pipeline

begins production in July 1977. The Beaufort Sea is covered by ice for approximately 9 months a year but from June to October the open waters are a major migratory pathway and summering area for seabirds. Drilling would pose major environmental problems because oil is not readily degraded at the ambient water temperatures in the Beaufort Sea. Recently elected Governor Jay Hammond is seeking alternatives to the Beaufort Sea lease which was originally proposed by the previous administration.

Other Alaskan News

Biologists Perish During Seabird Survey. On 30 September 1974, U. S. Fish and Wildlife Service biologists Bob Bergman, Larry Haddock and Leonard Boughton and pilot Bob Johnson departed from Anchorage to conduct a seabird survey in the Gulf of Alaska. They failed to arrive in Kodiak as planned, and an intensive search failed to find any sign of the missing aircraft. The three biologists had worked on a number of projects relating to the impact of oil exploration on seabirds. The seabird library in the Anchorage Office of the Fish and Wildlife Service has been named in honor of Bergman.

BLM Funds Seabird Studies in Alaska to Hasten OCS Development of Petroleum. The Bureau of Land Management has contracted through the National Oceanic and Atmospheric Administration for environmental studies related to OCS leasing and development in Alaska in the amounts of $7.6 million in the last quarter of fiscal year 1975 (ending June 30, 1975) and $24.3 million in fiscal year 1976. Of these amounts more than $1.1 million have been ear-marked for bird studies in the Gulf of Alaska, the Bering Sea and the Beaufort Sea. Additional funding will come for bird studies in the Chukchi Sea during 1975 or 1976, with money for all areas continuing from 3 to 5 years after the initial funding. Universities, the Alaska Department of Fish and Game, agencies of the federal government, and others will be participating in the research. The newly formed Coastal Ecosystem Program within the Office of Biological Services, U. S. Fish and Wildlife Service Anchorage, has at the request of NOAA assumed responsibility for coordination and review of all marine mammal and marine bird studies being contracted.

The objectives of the BLM environmental studies program are: (1) to provide information for management decisions regarding development of mineral resources, especially oil and gas, (2) prepare environmental impact statements, (3) establish bases for prediction of impacts of OCS activities in frontier areas, and (4) acquire impact data that may result in modification of leasing regulations, operating regulations or orders to permit for efficient mineral

resource recovery with maximum environmental protection. Three major tasks related to bird studies were identified as being: (1) to summarize and evaluate existing literature and unpublished data on the distribution, abundance, behavior, and food dependencies of marine birds; (2) to determine the seasonal density distribution, critical habitats, migratory routes, and breeding locales for principal marine birds species in study areas; to identify critical species particularly in regard to possible effects of oil and gas development; and (3) to describe population dynamics and trophic relationships of selected species at offshore and coastal study sites. Other tasks addressed the needs for assessment of acute and chronic effects of crude oil, its component fractions, and other petroleum-associated chemicals on physiological and behavioral mechanisms of selected arctic and subarctic organisms of the marine environment (including birds); determining levels of trace metals and hydrocarbons in selected marine organisms; and determining the incidence of disease in birds for use in evaluating future impacts of petroleum-related activity.

Although the support of these kinds of studies is commendable (it is also a legal necessity under the National Environmental Policy Act if petroleum development is to take place) some Alaskans view the information as coming too late to influence the selection of lease areas based upon their environmental values. In addition to studies in OCS frontier areas of Alaska, the BLM is considering similar lease programs with associated environmental studies near the Baltimore Channel, Gulf of Mexico and off southern California.

Regional representative for Alaska - George J. Divoky.

British Columbia

Current Research

British Columbia Provincial Museum (Victoria, B. C.).

1. Inventory and cataloging of seabirds on the coast of British Columbia.
2. Censusing of seabird colonies in the Strait of Georgia and central and northern tip of Vancouver Island.
3. Banding of Glaucous-winged Gulls. It is hoped that age-class dispersal can be determined.
4. The collation of weathership seabird observations.
5. Pelagic field trips. Trips are being organized for spring and fall.

Principal Investigators: C. J. Guiguet, R. W. Campbell, and R. Y. Edwards.

Regional representative for British Columbia - Spencer G. Sealy.

Washington

Current Research

University of Puget Sound (Dept. of Biology, Tacoma, WA 98416)

Biology of an endangered population of Caspian Tern in Grays Harbor, Washington.
Principal Investigator: Steven Penland.

University of Washington (Wildlife Science Group, College of Forest Resources, Seattle, WA 98195)

Two of the three studies initiated in 1974 on Destruction Island will be continued this year. These include studies of the breeding ecology of the Rhinoceros Auklet and the Black Oystercatcher. The Rhinoceros Auklet continues to be the focal point of research at the University of Washington. All three major breeding colonies are now being studied. The study on Protection Island is being initiated this year by graduate student Ulrich Wilson. The major thrust of this study is the effects of human disturbance on the breeding biology of the Rhinoceros Auklet.

1. Population ecology of the Rhinoceros Auklet on Smith Island National Wildlife Refuge.
2. Baseline survey of marine birds in Puget Sound.
   Principal Investigator for above two studies: David A. Manuwal.
3. Ecology and competitive relationships of the Black Oystercatcher on Destruction Island.
   Principal Investigator: David Nysewander.
4. Ecology of the Rhinoceros Auklet on Destruction Island.
   Principal Investigator: Lora L. Leschner.
5. Effect of human disturbance on the biology of the Rhinoceros Auklet on Protection Island.
   Principal Investigator: Ulrich W. Wilson.
6. The present distribution and abundance of the Double-crested Cormorant in Puget Sound and Gulf Island of British Columbia.
   Principal Investigators: David A. Manuwal and R. Wayne Campbell (British Columbia Provincial Museum).

Conservation Notes

Oil transport in Puget Sound and coastal Washington. It is evident that the oil issue in this state is going to be a

critical one to the welfare of existing marine bird populations. Several proposals for transporting oil have been made. These include tanker traffic directly to the Anacortes area, construction of an underwater pipeline from Port Angeles to Anacortes, a major facility at Port Angeles, and offshore oil tanker terminals connected via pipeline to Port Angeles. There are undoubtedly others. At this point it is difficult to say just what is going to happen.

Regional representative for Washington - David A. Manuwal.

Oregon

Current Research

Audubon Society (Corvallis, OR 97330)

Pelagic field trips. Trips are scheduled at least twice a year (spring and fall). For further information contact Fred Ramsey, Dept. of Statistics, Oregon State University, Corvallis 97331.

Oregon State University (Corvallis, OR 97331)

1. Taxonomic and behavioral aspects of interbreeding between Glaucous-winged and Western Gulls. Field work is being done on Destruction Island, Washington; Greater Chain Island, British Columbia; and Yaquina Head, Oregon. Principal Investigators: Wayne Hoffman and John A. Wiens (Dept. of Zoology), and J. Michael Scott (U. S. Fish and Wildlife Service, Hawaii).
2. Resource allocation in Leach's and Fork-tailed Storm-Petrels. Recently completed work. Principal Investigators: William A. Pearcy (Dept. of Oceanography) and J. Michael Scott (U. S. Fish and Wildlife Service, Hawaii).
3. Community organization and pelagic distribution of seabirds off Oregon. Manuscript in preparation. Principal Investigator: J. Michael Scott (U. S. Fish and Wildlife Service, Hawaii).
4. Distribution and abundance of seabirds in Yaquina Bay, Oregon. Weekly censuses of Yaquina Bay. Principal Investigators: Robert E. Olson and Peter Rothlisberg (Marine Science Center, Oregon State University, Newport, OR 97365).

U. S. Fish and Wildlife Service (William Finley National Wildlife Refuge, Route 2, Box 208, Corvallis, OR 97330)

Annual aerial census of marine bird colonies in Oregon. Principal Investigator: Dick Rodgers.

Independent Studies

Distribution and abundance of Oregon birds. Presently in preparation.

Principal Investigator: M. Ralph Browning (Bird and Mammal Laboratory, National Museum of Natural History, Washington, D. C. 20560).

Personnel Change

C. Fred Zeillemaker, formerly of William L. Finley National Wildlife Refuge, is now assistant refuge manager of Hawaiian Islands National Wildlife Refuge.

Regional representative for Oregon - J. Michael Scott.

Northern California

Current Research

California Department of Fish and Game (1416 9th St. Sacramento, CA 95814)

1. Inventory of nesting birds on offshore rocks in California.
2. Cormorant nesting studies.
3. Brown Pelican inventory.
4 Pelagic bird inventories.

Principal Investigator: Howard R. Leach.

California Department of Fish and Game (Marine Technical Information Center, 350 Golden Shore, Long Beach CA 90802)

Seabird observations in the California current. Seabird observations are made from research vessels and included in the annual data report "California Cooperative Oceanic Fisheries Investigations". Copies of the report can be obtained from the Center's librarian.

California State University, Humboldt (Dept. of Biology, Arcata, CA 95521)

1. Studies on the biology of storm-petrels.
   Principal Investigator: Stanley W. Harris
2. Taxonomy of the Yellow-footed Western Gull (Larus occidentalis livens) in the Gulf of California.
   Principal Investigator: Ron LeValley
3. Distribution and occurrence of birds off extreme northern California.
   Principal Investigators: Stanley W. Harris and Ron LeValley.

California State University, Moss Landing Marine Laboratory (Moss Landing, CA 95039)

1. Taxonomy of fossil marine birds of central California.
2. Distribution and occurrence of marine birds in Monterey Bay.
   Principal Investigators: G. V. Morejohn and students.
3. Diets of marine birds in Monterey Bay.
   Principal Investigator: Don M. Baltz.

California State University, Sacramento (6000 J. St., Sacramento, CA 95819)

1. Functional anatomy in marine birds.
2. Biology of alcids.

Principal Investigator: M. D. F. Udvardy.

California State University, San Jose (San Jose, CA 95514)

Circannual and circadian rhythms in marine birds on the Farallon Islands. Studies are being conducted in conjunction with the Point Reyes Bird Observatory.
Principal Investigator: L. R. Mewaldt

Point Reyes Bird Observatory (Box 321, Bolinas, CA 94924)

1. Studies on the marine bird community on and near the Farallon Islands.
2. Beached bird survey of California.
3. Maintenance of Farallon Research Station for studies (by other workers) on marine birds and mammals.

Principal Investigators: David Ainley and staff.

U. S. Fish and Wildlife Service (California State University, Humboldt, Arcata, CA 95521)

Birds of coastal bays and estuaries.
Principal Investigator: Paul Springer.

University of California, Bodega Marine Laboratories (P. O. Box 247, Bodega Bay, CA 94923)

Studies on pollutants in marine ecosystems and their biological effects.
Principal Investigator: Robert W. Risebrough.

University of California, Santa Cruz (Santa Cruz, CA 95060)

1. Behavioral ecology of gulls.

Principal Investigators: R. Pierotti and K. Briggs.

2. Studies on the biology of marine mammals.

Principal Investigator: K. W. Norris.

Conservation Notes

Deep Water Tanker Port. A deep water oil tanker port is being considered by Standard Oil of California for positioning three miles off the California coast at Morro Bay. Super tankers would discharge their oil at a buoy and the oil would then be piped to refineries in the Richmond area (overland route). Environmental impact statements are now being drafted. Much local oppostion exists. There is of course next to nothing known about marine bird populations using that area. Volunteers in the Point Reyes Bird Observatory's beached bird census have been tallying marine birds dead on at least one beach in the Morro Bay area for four years.

Herring Fishery in Tomales and San Francisco Bays. During the past two years an unregulated herring fishery was brought under control by legislation authored by State Senator Peter H. Behr. Much of the catch was being (is) shipped to Japan but it is now limited to 600 tons annually. Legislation now being considered would restrict the harvest to experienced herring fishermen who own boats outfitted with the proper equipment. Senator Behr is considering legislation to ban the fishery altogether. Recent, yet to be published work completed by researchers from Point Reyes Bird Observatory and the Museum of Vertebrate Zoology (UC Berkeley) indicate herring to be part of the diets of marine birds and mammals in the area but this work does not include populations of these predators that use Tomales and San Francisco Bays heavily. Casual observations indicate herring eggs to be important for local populations of larids during a very short period (herring spawning) each year.

Regional representative for northern California - David G. Ainley.

Southern California

Current Research

This time, current research will be broken down by general topic. Hopefully, this will provide more interesting reading.

Studies of the yellow-footed Western Gull

Judith Hand (Biology Dept., UCLA Los Angeles, CA) will obtain sound recordings and other field data in the vicinity of Cabo San Lucas and Bahia de Magdalena during the field season of 1975. This is an area of possible overlap between the wymani and livens subspecies. Ron LeValley (Dept. of Biology, Humboldt State University, Arcata, CA) will write up data obtained in 1974, and will obtain more data from the Gulf of California in 1975. Several manuscripts are being prepared by George Hunt, (Dept. of Population and Environmental Biology, University of California at Irvine) and Dan Anderson (U. S. Fish and Wildlife Service, P. O. Box C, Davis, CA) on the breeding biology of this species.

Baseline studies for the evaluation of environmental impact of offshore oil drilling.

For the past six months, much has been said and proposed, but no studies were begun at the writing of this report. The latest word is that by the end of February, BLM will begin to let contracts for baseline studies. As yet, a program manager for southern California has not been designated. Hopefully, I can include a list of the

studies underway and their investigators in the next PSG Bulletin. As it appears now, most baseline research will be conducted by various universities and other research agencies in southern California, and proposed research is being reviewed now by BLM.

Studies of the California Brown Pelican.

Dan Anderson (USFWS) and Howard Leach (Calif. Dept. of Fish and Game 1416 9th St., Sacramento CA) will continue surveys of breeding pelicans off the California coast. Anderson will also conduct surveys of productivity, numbers, and pesticide residues in the Gulf of California. Jim Keith (USFWS, Bldg. 16, Federal Ctr. Denver CO) will study the effects of food shortage and pollutants on reproductive behavior of Brown Pelicans in the Gulf of California.

Ecological studies of various seabird species.

George Hunt (UC, Irvine) will continue his studies of supernormal clutches and female-female pairing in Channel Islands Western Gulls. He will also supervise a thesis study on Mandarte Is., B. C., of structure and predation in cormorant colonies. Howard Leach (DFG) is trying to coordinate an ecological study of Brandt's Cormorants on San Nicolas Island. J. R. Jehl, Jr. (San Diego Nat. Hist. Mus. P. O. Box 1390 San Diego, CA) will continue to survey pelagic birds off southern California and Baja California.

Conservation Notes.

European rabbits on San Martín Island. San Martín has had its problems! Brown Pelicans have nearly been eliminated from there as a breeding bird by overenthusiastic tourists and "scientific" curiosity-seekers. Human disturbance seems to have been a major problem for other nesting seabirds on that island, as well. Now, I recently received an unconfirmed report from J. R. Jehl that European rabbits have most likely been introduced onto the island by a local fisherman. There have been several sightings of rabbits recently, and an expedition is needed to confirm this. If true, action should be taken to eliminate the rabbits from the island.

Offshore oil development. This potential environmental insult is proceeding at a rapid pace in southern California, and the rapid development of offshore oil has attracted the opposition of several high-level politicians from California.

Proposed projects first require meaningful environmental impact statements--the statements, however, need to be predicated on sound and thorough scientific data and technical expertise. Then, to prevent environmental damage, impacts that are envisioned, predicted, or suspected in the impact statement are avoided in the actual development of the resources utilization.

Controversy arises at all levels in this process. There is concern in California (and in other oil lease areas) that adequate research will not be accomplished for a meaningful impact statement. Too much research, in fact, may cause delays in oil development that are unacceptable to economic and political goals. Environmentalists are concerned that oil development will be pushed forward, regardless of potential impact, or that research spending will skirt the real issues, satisfy the impact statement requirements, but not the environmental issues. State politicians feel the federal government is forcing this upon the state, and that the state itself stands to lose environmentally--and financially.

The oceanic ecosystem and all living ocean resources stand to lose if proper research is not conducted, and then if proper safeguards are not initiated. Regarding the initial phase of impact evaluation, I believe a central issue in environmental protection here will be the instigation of adequate coordination of research activities, and how strong, authoritative, and knowledgeable the coordinating agency will be. The issue itself is undoubtedly a mixture of politics, energy policy, and environmental concern. Where do the seabirds stand?

Regional representative for southern California - Daniel W. Anderson.

Mexico

No report was received.

Hawaii

Current Research

Sea Life Park (Oahu, HI)

Rearing of Red-footed Boobies. Originally chicks were collected from a nearby colony and raised in the park. Now several pairs breed in the park each year. Program in tenth year.

State University of New York at Buffalo (Dept. of Physiology, Dept. of Medicine, Buffalo, NY 14214)

Eggshell permeability studies. Permeability of eggshells is being determined to establish a baseline index so that the effects of future environment pollution can be measured.

Principal Investigator: Charles A. Paganalli.

U. S. Fish and Wildlife Service (337 Uluniu St., Kailua, HI 96734)

1. Status, abundance and distribution of the seabirds of the Hawaiian Islands National Wildlife Refuge. Continual monitoring of populations in the leeward Hawaiian Islands.
2. Status, abundance and distribution of the seabirds of Johnston and Rose Atoll and Baker, Jarvis, and Howland Islands National Wildlife Refuges.

Principal Investigators: Palmer C. Sekora and C. Fred Zeillemaker.

U. S. National Park Service (Haleakala National Park, HI)

Status and distribution of the Dark-rumped Petrel (Pterodroma pheaopygia sandwichensis)

Conservation Notes

Northwest Islands. Wilderness designation is being held up by boundary negotiations with the state although the President has submitted to congress a wilderness proposal for approximately 1700 acres of exposed land. The issue of ownership of submerged lands is complicated by pressure to open inshore waters for commercial fishing.

Kaula Rock. This island lies off Niihan and is a bombing target for the military. The outcome of congressional hearings regarding Kahoolawe Island may determine whether pressure for expanded use of alternate sites (such as Kaula) will be a problem in the future.

Regional representative for Hawaii - Robert Shallenberger.

Japan

Current Research

Hokkaido University (Research Institute of North Pacific Fisheries, Faculty of Fisheries, Hokkaido University, Hadodate)

1. Food and feeding habits of alcids are being studied from 10 April to 31 May, 1975 in the Northern Pacific Ocean and Bowers Bank in the Bering Sea by the RV Habomai Maru No. 21.

2. Seabird observations around the Buldir Island by the RV Habomai Maru No. 21.
Principal Investigator: Tsuneyasu Hamanaka

Hokkaido University (Division of Food Science and Technology, Faculty of Fisheries)
PCB concentration in seabirds.
Principal Investigator: Kozo Takagi

Association for the Protection of Wild Ansers (983 Sendai-Shi, Hara-Machi 1-2-31, Miyagi-Ken, Japan)
Goose observations on the northern migration route from the overwintering area.
Principal Investigator: Yoshio Yokota

Regional representative for Japan - Haruo Ogi.

PACIFIC SEABIRD GROUP POLICY STATEMENT

Incidental Seabird Kills from Salmon Gillnet Fisheries

The Danish salmon gillnet fishery off West Greenland has been responsible for the incidental death annually of approximately one-half million Thick-billed Murres (Uria lomvia) and a smaller number of other seabirds. Hunting losses on the Greenland coast account for an additional three-quarters of a million birds annually. Deaths from natural causes, from oil pollution and from an unknown amount of hunting on the Newfoundland coast undoubtedly bring the total kill well above 1.5 million birds, the annual production of this species in the western North Atlantic (Tull, Germain and May, Nature 237(5349):42-44, 1973). An agreement between the United States and Denmark will curtail Denmark's gillnet salmon catch progressively until 1976, when only an inshore catch of 1,100 tons will be permitted.

In the North Pacific the Japanese salmon gillnet fishery, operating since 1952, would be expected to have an even more destructive effect on seabirds, considering that their annual salmon catch is about one hundred times that off West Greenland. The Japanese mothership fishery operates west of 175°W and north of 46°N, the land-based fishery operates west of 175°W and south of 46°N and the coastal fishery, made up of 1,380 short-haul vessels, operates off Hokkaido. Based on the 1970 landings of 108,982 metric tons, the relative salmon catches of these three fisheries are 33.4%, 44.9% and 21.7% respectively.

Data recently collected on research vessels of the U. S. National Marine Fisheries Service permit an estimate of the magnitude of the seabird kill by the Japanese salmon gillnet fishery for the mothership area and eastward to 165°W. The Japanese salmon fishery is restricted to the waters west of 175°W by agreement with the United States. The estimate of the total kill of seabirds in the mothership area may be made by calculating the bird mortality per length of gillnet set by research vessels, multiplied by the total length of gillnets set by the 369 catcher-boats of the Japanese mothership fishery. About 2,900 miles of nets are set and retrieved daily during the 65 day (approximately) fishing season. The estimated annual mortality in the mothership area is 70,000 to 245,000 birds. The lower figure is based on data from 10 cruises west of 175°W. The higher figure is based on data from 20 cruises, including those in the first figure, west of 165°W. Assuming similar seabird densities in the areas of the land-based and coastal fisheries and knowing the fishing effort in these two areas, the estimated annual mortality is between 210,000 and 732,000 birds. Since 1952 as many as 4.7 million birds may have been killed by the Japanese salmon gillnet fishery. It must be stressed that seabird densities are

not known to be similar for the three areas in question, so that projection of bird kill figures from one area to all three is highly speculative. Nevertheless, these figures point to the potential magnitude of the problem.

In the mothership area and adjacent seas to the east, in addition to murres (58% of birds killed), significant numbers of shearwaters (27%), puffins (9%), and fulmars (5%) are killed, as are lesser numbers of small alcids, albatrosses and storm-petrels. The murres and puffins taken in the mothership area are of U.S. and Russian origin, while the shearwaters come from New Zealand, Australia and Chile. In the coastal fishery area Japanese and Russian alcids are taken. Our knowledge of the populations of the species affected is insufficient to suggest whether their annual reproduction can tolerate such losses.

The birds suffering the greatest mortality as a result of the gillnet fishery are diving birds: Murres and puffins. Diving birds as a group are also the most vulnerable to oil pollution and have suffered heavy losses as a result of past oil spills (J. Smail et al., California Birds 3:25-32, 1972; W.R.P. Bourne, Ibis 112:44-51, 1970). In addition, most North Pacific seabirds are at the height of their breeding season during the salmon gillnet season and have their greatest densities within 50 miles offshore from breeding islands and headlands.

In view of this alarming situation, the Pacific Seabird Group respectfully urges governments of nations with extensive fishing fleets, and particularly the governments of Denmark, Japan and Korea to undertake the following:

1. Immediately begin research on the best means of reducing the mortality of seabirds from driftnets without substantial harm to their fishing industries.

2. Eliminate gillnet fisheries within 50 miles of any seabird breeding colonies.

3. Place observers aboard the gillnet boats to provide more detailed information on the distribution, abundance and annual mortality for seabirds in the general area of the fishery.

LACK OF STUDY OF PARASITES OF SEABIRDS

Study of the ecology and biology of a species is incomplete without inclusion of the parasites (both ecto- and endoparasites) and their effect on populations. Admittedly, parasites generally seem to have little effect on the health of the host, but many parasites do, on occasion, cause pathological conditions, and parasites add a constant stress which may overwhelm the host when it enters an extreme situation.

Determination of the importance and effects of a particular parasitic infection, a supposed parasitic epizootic for instance, can be greatly aided by knowledge of the prevalence and intensity of normal parasites of that host. This knowledge is lacking for most aquatic (and terrestrial) birds in North America with regard to reported helminth parasites. Fifty-one per cent of freshwater species, but only 17% of marine species, have had some parasite survey made; at the other end of the scale 20% of freshwater species and 52% of the marine species have never had even one specimen examined thoroughly (see table). The most typically marine birds are the poorest known; 12 species of alcids and 22 species of the tubed-nosed swimmers have never been examined for parasites in North America.

All the possible aspects of parasite infections cannot be recognized until the parasites have been collected. Conditions of migration, sex, age, food habits, habitats, alternation of habitats, associated host species, may all be reflected in the parasites. Parasites from beached, diseased, or injured birds and from healthy normal birds of all ages are needed. Preferably, any category to be analyzed and compared should be represented by about fifteen specimens as a minimum. Carcasses should be fresh, or quick-frozen and maintained in frozen condition until examination. Few specialists are available for such examination; this area of study needs some new workers to fill an unexploited gap of knowledge. Parasitologists should be urged to influence students toward such studies, particularly where numbers of beached and normal birds could be provided. The junior author of this note is a specialist in this field and would be happy to examine any specimens sent to him or to enter into cooperative studies with other research workers.

Students of parasites of northern Pacific birds have the advantage of a large amount of parasitological survey work performed in Siberia. A series of Soviet helminthological expeditions, many of several years' duration, covered Chukotka, Kamchatka, Wrangel and Bering Sea islands, Sakhalin, Yakutia, etc., examining thousands of birds for parasites. We have no data for alcids and petrels from the area, but assume information is relatively complete, as emphasis was placed on fish eating

birds and birds of potential economic importance, positive or negative. In Yakutia (inland, unfortunately) helminths listed average 24.2 per species in shore birds, 20.1 for gulls and terns, 27.6 for loons, and 41.9 for waterfowl, many more than known for these groups in North America.

There are no compact manuals or reference books for identification of parasites of individual bird groups. The senior author recently published a "Key to nematodes reported in waterfowl" (Resource Publ. 122, Fish and Wildlife Service), and hopes to make such keys available for other groups of waterfowl parasites also. The junior author hopes to complete an identification manual for parasites of marine birds.

Malcolm E. McDonald, Bear River Res. Station, Box 459, Brigham City, Utah, 84302 and William Threlfall, Department of Biology, Memorial University of Newfoundland, St. John's, Newfoundland Canada, A1C 5S7.

Comparison - Helminths Reported from Freshwater and Marine Birds,

North America (See note)

	Freshwater					Marine and Coastal				
	No. of Species	Species with surveys	Species never examined	Average Helminth species	Range Helminth species	No. of Species	Species with surveys	Species never examined	Average, Helminth species	Range Helminth species
Gaviiformes	0					4	0	0	7.25	2-19
Podicipediformes	6	5	1	28.5	1-48	0				
Procellariiformes	0					24	0	22	0.4	0-4
Pelecaniformes	3	1	0	13.0	9-16	13	1	7	4.3	0-35
Ciconiiformes	15	9?	2	12.8	0-35	3	0	2	1.0	0-3
Anseriformes	35	24	3	29.0	0-86	11	1	1	12.3	0-27
Gruiformes	12	8	4	16.8	0-53	0				
Charadrii	37	10?	10	6.3	0-36	13	5?	5	5.7	0-14
Lari	8	4?	1	13.1	1-39	29	7?	12	8.3	0-65
Alcae	0					20	6	12	2.25	0-18
Coraciiformes	2	1	1	10.0	1-19	0				
Passeriformes	4	1	1	8.0	0-23	0				
TOTALS	122	63 (51.6%)	23 (18.9%)	16.5	0-86	117	20 (17.1%)	61 (52.1%)	5.1	0-65

1 - survey, group of specimens fully examined and helminths reported
2 - none or only one helminth reported
Note - Host species were assigned to habitat probably most commonly used; for many of these, collections were probably mostly made in fresh water, even though the species is included as marine (loons and many gulls for example).

OIL SPILL PREPARATIONS:

California Sets the Pace and Biologists Lag Behind

In 1937, thousands of aquatic birds perished in oil spilled following the collision of a passenger steamer and the tanker Frank H. Buck at San Francisco. The governmental response to wildlife involvement in that spill was purely one of local initiative. A lone wildlife agent walked many miles of beaches with a shotgun and a large supply of ammunition in order to humanely dispatch beached oiled birds. Two biologists, James Moffitt and Robert Orr, decided to take advantage of the situation and collect bird skeletons. It occurred to them, somewhat belatedly, that it might be to some benefit to census affected birds but they did no more than note the species affected and count dead murres along a short stretch of beach (Moffitt, J. and R. Orr, Calif. Fish and Game 24:239-244, 1938). Another study was conducted on that spill by E. C. Aldrich (Bird-Lore 40:110-114, 1938) but all studies were inadequate. Today the California Department of Fish and Game is prepared to make an effort to save oiled birds but the biologists are apparently no more prepared now than they were 38 years ago for assessing the impact of a spill on bird populations.

California has established an Oil Spill Response Team composed of eight state agencies that is activated whenever there is a sizable oil spill. Activation is facilitated by a toll-free telephone number (800-852-7550) that anyone may call, day or night, to report a spill. Immediately following verification of an oil spill, people are dispatched to ascertain extent, source and the toxicity of the oil. Cleanup operations are initiated and the threat to local wildlife is estimated. If needed, an operations center is established, complete with telephones and radio communications equipment. If the spill is in tidal waters, the responsibility for physical cleanup goes to the Coast Guard, otherwise it becomes the responsibility of the Environmental Protection Agency. Nearly all other responsibilities, such as public health and wildlife and habitat restoration, will be shouldered by the Oil Spill Response Team. The leadership of the Team goes to the agency with the greatest expertise in solving the major problems created by the spill. For example, if the spill were on a highway (tanker truck accident) the California Highway Patrol might assume team leadership but the California Department of Health would direct the Team if public safety were threatened by the spill. In most cases, however, the California Department of Fish and Game would lead the Team since the typical oil spill involves wildlife and wildlife habitat.

Bill Clark of the Department of Fish and Game has established several oil spill supply centers in California. Each supply center has boxes (to transport oiled birds), cloth (to wrap birds in transport), and barrels of cleaning fluid. One of

the supply centers is in the Central Valley to cover the possibility of an oil spill along an interior waterway. In the San Francisco Bay area there is a large two story building on Coast Guard property that can house up to 5,000 birds.

California recognizes that volunteer citizen participation in an oil spill is desireable providing sufficient thought has been given to communications and management. All volunteers that clean oiled birds in California must first register for state employee compensation insurance at a bird cleaning center. At that time the volunteers receive identification cards that allow them to be admitted to the bird cleaning area. This protects both the volunteers and the state in case of personal injury. Volunteers can be trained with the help of audio-visual aids (prepared by the IBRRC) to clean birds and prepare them for return to the wild. Recent advances in bird cleaning techniques result in a small percentage of oiled birds being returned to the wild within 24 hours. Most birds require a few days and some need as long as three weeks.

Agencies in California, especially the Department of Fish and Game, have come a long way since 1937. They are making significant efforts to be ready to save oiled birds, whether "game" birds or non-economic species. Biologists, on the other hand, have made little progress in preparing to study birds killed in an oil spill. What is needed initially is a comprehensive program of beached bird surveys. This will provide baseline information that will show the normal pattern of mortality and allow the impact of spills and natural calamities to be known. We know, for example, that there were larger numbers of murre carcasses on central California beaches in 1973 than in previous years but there is little quantitative information to tell us the actual magnitude of the die off. Audubon chapters, environmental groups and schools need to be educated on how and why these surveys are conducted so that they may start their own. With regard to disasters, either natural or man made, each region on the coast should have a communications network so that enough people can be mobilized to gather information on the extent, species composition and magnitude of bird mortality. People wishing to start beached bird surveys in their area or wanting to help the PSG develop a program for systematically gathering information on seabird disasters are asked to contact David G. Ainley (Coordinator of the PSG Working Committee on Beached Bird Surveys and Seabird Disasters at Box 8, Alder Rd., Bolinas, CA 94924) or the IBRRC. David C. Smith, Intl. Bird Rescue Research Center, 2701 8th St., Berkeley, CA 94710.

PROCEEDINGS OF THE FIRST ANNUAL MEETING OF THE PACIFIC SEABIRD GROUP

The First Annual Meeting of the Pacific Seabird Group was held 6-8 December at the Providence Heights Education and Conference Center in Issaquah, Washington. David A. Manuwal of the University of Washington was Program Chairman.

Business Sessions

The Executive Council met on the evening of 5 December and the morning of 8 December. The general membership meeting was held on the morning of 7 December.

Election of Officers. - The Executive Council reelected J. Michael Scott as Chairman, Spencer G. Sealy as Vice-Chairman and George J. Divoky as Secretary-Treasurer.

Bylaws. - The proposed bylaws were modified by the Executive Council and will be submitted to the general membership in 1975.

Corresponding members. - The Executive Council decided to not appoint specific people as corresponding members (persons who report on research and conservation in areas away from the west coast of North America). Instead reports from these areas will be obtained on an informal basis.

Working Committees. - Working committees were discussed at an evening session on 7 December. Reports are being prepared by the working Committee coordinators and forms should be completed by 1976.

North American Seabird Group. - Paul Buckley proposed that PSG work for the formation of a North American Seabird Group. Such an organization would allow PSG to remain autonomous but would provide a unified voice for North Americans interested in seabirds. It was decided that for the present, PSG should devote its efforts to its own programs but that at sometime in the future the PSG might want to participate in a North American seabird organization.

Other business news is contained in the "PSG News" section of this Bulletin.

Special Events, Social Events and Field Trips

On the evening of 7 December the following movies were shown:

"Puffins, predators and pirates".
David N. Nettleship, Canadian Wildlife Service, Ottawa, Ontario.

"Manana, island of birds".
Robert J. Shallenberger, Hawaii Division of Fish and Game, Honolulu, Hawaii.

"Farallon Light".
Richard Petersen and Point Reyes Bird Observatory, Bolinas, California.

A reception was held on the evening of 6 December. A one-day field trip was conducted 8 December to Blaine, Washington to view seabirds and waterfowl.

Report of the Treasurer

1974

RECEIPTS

Grants-in-aid from National Audubon Society	$500.00
Contribution from Western Oil and Gas	200.00
Total Receipts	$700.00

DISBURSEMENTS

Pacific Seabird Group Bulletin	$370.28
Postage and Postal Service Fees	73.07
Stationery	52.20
Chairman's Expense	12.45
Annual Meeting Expense	69.64
Bank Charges	8.34
Total Disbursements	$585.98
Excess of Receipts over Disbursements	$114.02

Attendance

Registration at the meeting totaled 75 people though approximately 50 additional people attended most of the paper sessions. Attendees were: Daniel W. Anderson, Gordon Alcorn, Edgard Bailey, James C. Bartonek, Richard Bauer, Range Bayer, Alex Benedict, Alice Benedict, Alice Berkner, Alice Bolten, Francine G. Buckley, Paul A. Buckley, Malcolm Coulter, Matthew Dick, George J. Divoky, Walter R. Donaghho, William Drury, Clifford Fiscus, Warren L. Flock, David Frazer, William W. H. Gunn, Jane M. Glass, Bob Garrott, Diane Garrott, Juan Guzman, Judith Hand, Dennis Heinemann, Wayne Hoffman, Marshall Howe, M. E. Pete Isleib, Steve Johnson, G. Kaiser, Paul Kelly, Jim King, C. Eugene Knoder, Lora Lynn Leschner, Ron LeValley, Liz Lindeman, David A. Manuwal, Naomi Manuwal, Roy Mason, E. Charles Meslow, M. T. Myres, David N. Nettleship, David Nysewander,

Haruo Ogi, Steven Penland, Raymond Pierotti, Edward W. Pough, Frank Richardson, Carroll Rieck, Ian Robertson, Sievert Rohwer, Gerald Sanger, John W. Schoen, Madeline Schouten, J. Michael Scott, Spencer G. Sealy, David C. Smith, Ian Smith, Steve Speich, Ken Summers, Jerry Tangreen, Eric Tull, William Twiet, M.D.F. Udvardy, Robert L. Van Wormer, T.R. Wahl, John Ward, Stuart Warter, Duff H.S. Wehle, Doug Weschler, Clayton White, John Wiens, Howard M. Wight.

Paper Sessions

Symposium on the Biology of the Alcidae

prepared by

Spencer G. Sealy and M. D. F. Udvardy

Breeding biology of the Rhinoceros Auklet on Cleland Island, British Columbia. KEN SUMMERS, Department of Zoology, University of British Columbia, Vancouver, British Columbia.

The breeding biology of Rhinoceros Auklets (Cerorhinca monocerata) was studied on Cleland Island, B. C., in 1969 as a byproduct of a project sponsored by Dr. R. H. Drent. The island is a small seabird colony which then contained 375 to 450 breeding pairs of Rhinoceros Auklets.

Peak hatching was between 9 and 21 June after an incubation period of about 42 days. The fledging period averaged 50 days. Hatching success was 90%. Parents remained with chicks for two days after hatching. The first meals consisted of pre-digested fish, whole fish being accepted as they approached half their peak weight. Feeding occurred once each night by each parent. When the chicks were using the maximum amount of fish that was brought by the parents, growth slowed down, stopping at about 76% of adult weight. After a further 4.8 days they dropped to a weight of 358.5 grams or 69% of the adult weight of 518 grams. The next night they fledged. Fledging success was 72% of the chicks which hatched and the overall success was 66%.

Characteristics of the breeding biology support the close relationship of the Rhinoceros Auklet to the puffins.

Comparative biology of the Rhinoceros Auklet in different nesting environments. DAVID A. MANUWAL and LORA L. LESCHNER, College of Forest Resources, University of Washington, Seattle, Washington.

This paper compares the biology of the Rhinoceros Auklet on a typical coastal island (Destruction Island) and a more inland site (Smith Island, Strait of Juan de Fuca). Breeding population estimates for the two sites are 17,000 for Destruction Island and 1,600 for Smith Island.

The two islands differ in climate, soil type, vegetation, slope, and avifauna. The egg-laying period was from 7 May to 17 June on Destruction and 10 May to 6 June on Smith Island. Breeding success was 67% on Destruction and 67% on Smith Island. Desertion was high for both colonies. The average nestling period was 54.3 days on Destruction Island and 48.3 days on Smith. Fledging weight on Destruction Island was 521 g and 356 G on Smith. This represents 59.1% and 65.3% of adult weight respectively. Adults brought at least four species of fish to the young. Other aspects to be discussed are nest-site selection, burrow occupancy, activity cycles, predation and human disturbance.

Geographic variation in the timing of molt and breeding in the Cassin's Auklet. STEVEN SPEICH, MIKLOS D. F. UDVARDY, DAVID A. MANUWAL, and STEPHEN M. ALDEN, Department of Biological Sciences, University of Arizona, Tucson, Arizona (Speich and Alden), Department of Natural Sciences, California State University, Sacremento, California, College of Forest Resources, University of Washington, Seattle, Washington.

Cassin's Auklet (Ptychoramphus aleuticus) breeds from the Aleutian Islands, Alaska to Baja California Sur, Mexico on coastal islands. This paper considers the timing of breeding and molt through that range. The sequence of these two events and the variation in their relative occurrence are also considered. The data are derived from egg records, and adult and juvenal skins. Similar data is presented from the Farallon Islands, California breeding population.

Notes on the Craveri's Murrelet. DANIEL W. ANDERSON and L. R. DEWEESE, U. S. Fish and Wildlife Service, Davis, California.

Four years data on the breeding range, nesting and productivity, flocking behavior, and feeding habits of Craveri's Murrelet (Endomychura craveri) in the Gulf of California are summarized. Craveri's Murrelets experienced a breeding failure in the Gulf in 1973 but indicated normal productivity in 1972 and near-normal productivity in 1974. The 1973 failure was paralleled by failures of other seabird species. Craveri's Murrelet is likely distributed almost solely in the Gulf of California during the breeding season, and there are few records to suggest any major nesting sites outside that area. These murrelets exhibit a pattern of post-breeding dispersal up the California coast and likely also south along the west coast of Mexico, again paralleling other nesting seabirds in the Gulf. This little-known species invites further, detailed, ecological studies.

Food and feeding habits of the Common Murre and Thick-billed Murre in the Okhotsk Sea, Northwestern Pacific Ocean and Bering Sea. H. OGI and T. TSUJITA, Research Institute of North Pacific Fisheries, Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

The predominant seabirds in the subarctic and arctic oceans, the Common Murre (Uria aalge) and Thick-billed Murre (Uria lomvia), spend most of their life in the ocean and depend for their survival upon the food supply of the oceans, except during the breeding seasons. To clarify the food and feeding habits in their oceanic life, the stomach contents of drowned murres that were captured accidentally with gillnetted Pacific salmon (Oncorhyhchus) are investigated.

A total of 1,855 stomachs of Common and Thick-billed Murres obtained from the three sea areas were examined as follows: (1) species composition of food organisms, (2) individual number and weight of food organisms, (3) regional comparison of food composition, (4) relation between food organisms and oceanographic structure, and (5) comparison of the feeding habits between the two species of murres.

Observations on the pelagic biology of the Tufted Puffin. GERALD A. SANGER, National Marine Fisheries Service, Northwest Fisheries Center, Marine Mammal Division, Sand Point Naval Supply Activity, Seattle, Washington.

Tufted Puffins, the most pelagic alcid species, were observed during two winter oceanographic cruises, in the Gulf of Alaska and off the California coast, and during an extensive summer cruise across the southern Gulf of Alaska and south of the Aleutian Islands.

In winter, Tufted Puffins were found virtually across the entire Gulf of Alaska up to 800 km from the nearest land, with densest concentrations occurring within a band extending 100-200 km from land. Density was generally lower off California, and although they were seen out to 200 km from the coast, the highest concentrations were within 50 km of land. In summer, puffins rarely occur far at sea; south of Adak Island (Aleutians), they ranged to nearly 300 km south, but most were within 100 km of the island.

Tufted Puffins displayed a strong tendency to be solitary at sea, especially in winter, e.g., of 170 birds seen in 135 sightings in the Gulf of Alaska, 65% were of single birds and 25% were in pairs. South of Adak in summer there was an increased tendency for flocking, but most sightings were still of single birds. The large majority of winter sightings were of puffins sitting, while south of Adak in summer most were flying, usually in a northerly or southerly direction, presumably enroute between breeding and foraging areas. Tufted Puffins were occasionally observed following, pacing or circling the ship, and were sometimes seen flying in mixed species flocks with Horned Puffins or murres.

A preliminary analysis of stomach contents generally support Bedard's thesis that puffins feed intermediately between fish and invertebrates. Thirteen stomachs from south of the Aleutians all contained squid remains, but only 5 had fish remains also. In six stomachs from the eastern Bering Sea, three contained fish only (probably Gadidae), one was very full of fish and amphipod crustaceans, one had amphipods only, and one was empty.

Seasonal density and distributional patterns of Alcidae in the near offshore waters of British Columbia. IAN ROBERTSON, Environmental Protection Service, West Vancouver, British Columbia.

From 1 June, 1972 to 31 March, 1973 regular aerial and opportunistic motor vessel surveys were conducted in the near offshore waters of British Columbia to determine density and distribution patterns of alcids, as well as other pelagic seabirds. Although densities of different species varied seasonally, on average the Common Murre was the most common species in the study area. In summer, however, Cassin's Auklet was recorded in the highest density. There was a tendency for the density of most species to increase with decreasing distance from shore. This was particularly pronounced in summer. However, in Cassin's Auklet and Tufted Puffin, there was a significant move offshore with the onset of winter.

Data from these surveys permit estimates of numbers of each species within the study area and these are presented. A discussion of survey techniques for pelagic seabirds is also presented, with special emphasis on the Alcidae.

The breeding distributions and present status of alcid populations in eastern North America and west Greenland. DAVID N. NETTLESHIP, Canadian Wildlife Service, Ottawa, Ontario.

Recent surveys of alcid populations in Atlantic Canada, Eastern Canadian Arctic, and West Greenland indicate that several species are declining in numbers. In temperate regions, there has been a long-term gradual decline of Razorbills and puffins towards the southern periphery of their breeding ranges, especially in the Gulf of St. Lawrence and the Bay of Fundy and vicinity. Common Murres have decreased at certain locations (e.g. north shore of the Gulf of St. Lawrence) and either maintained their numbers (e.g. Labrador) or increased dramatically (e.g. east Newfoundland) in other areas during the same time period. In arctic waters, Razorbills, Thick-billed Murres, Dovekies, and puffins appear to have declined considerably since the 1949's and 1950's, although reliable population data from earlier times are scarce. The occurrences and status of the Black Guillemot are uncertain. Reasons for these declines are obscure: possible prime causes are outlined and reviewed.

Coexistence, coevolution and convergent evolution in seabird communities:[1] a comment. J. BÉDARD, Department de Biologie, Faculte des Sciences, Universite Laval, Quebec, Que.

A recent article paralleling two seabird (Alcidae) communities of the North Pacific and the North Atlantic oceans is reviewed critically. A careful reappraisal of the literature cited reveals some looseness in the screening and interpretation of available facts. Furthermore, the quantitative basis upon which the argument of parallelism is based is demonstrated to be ethereal at best. Finally, doubts are raised, on methodological grounds, about the appropriatedness of comparing a fragment of a large North Pacific community lacking many of its important elements with an entire North Atlantic community.

The model of ecological segregation proposed for these birds is burdened with shortcomings and cannot adequately describe nor usefully model any significant trait of the organization of the bird communities involved.

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[1] Coexistence, coevolution and convergent evolution in seabird communities by Martin L. Cody, Ecology 54(1):31-44 (1973).

General Paper Sessions

Interspecific interaction in Brown Pelican feeding situations. DANIEL W. ANDERSON, U.S. Fish and Wildlife Service, Davis, California.

Brown Pelican feeding interactions were observed over the period 1971 to 1974 in the Gulf of California and off the California coast. This period covered years of high to moderate productivity as well as a year of nearly complete reproductive failure due to oceanographic changes.

Brown Pelicans feed more successfully when involved in the interaction-situation (pileup), feeding with other species of seabirds, sea mammals, and large, predatory fish. These situations are compared to those where pelicans feed more or less solitarily, and feeding success drops. The proportion of the adult population that breeds each year as well as reproductive success from year to year varied in relation to the proportion and frequency of pileups that pelicans encountered during the breeding season, and probably prior to it. Feeding interactions following breeding showed lower feeding successes by both adults and younger birds, as well as a greater proportion of solitary feeding. This is the period when the population is most dispersed.

Piracy on pelicans by Heermann's Gulls was also more successful in the pileup situation, but was never observed to exceed less than 5% success, even in pileups. Scavenging in the pelican breeding colonies during feeding of pelican young was much more successful for Heermann's Gulls, as well as Western Gulls.

Competition between the Pelagic Cormorant and Black-legged Kittiwake and its possible effects. MATTHEW DICK, Marine Collections, Museum of Biology, University of Alaska, Fairbanks, Alaska.

The northern Pelagic Cormorant (Phalacrocorax pelagicus pelagicus) and Black-legged Kittiwake (Rissa tridactyla) are sympatric from the Kurile Islands to southeastern Alaska. The Pelagic Cormorant nests among dense kittiwake concentrations, scattered along cliffs away from kittiwakes, or in monospecific or monogeneric colonies. It is the cormorant closest in size and nest site requirements to the kittiwake.

At Cape Peirce, Alaska, 1970, a segment of the Pelagic Cormorant population nesting among charadriiform seabirds showed twice the nest mortality of a segment nesting apart, even though the latter was much closer to a Glaucous-winged Gull concentration. This discrepancy may have been due to 1) incidental predation by gulls attracted to the seabird concentration and 2) direct competition of cormorants with kittiwakes for nest space and material.

At Buldir Island, Alaska, 1974, Pelagic Cormorants generally nested away from kittiwakes, whereas the larger and earlier-nesting Red-faced Cormorants tended to nest among them. This indicates a competition-related separation of Pelagic Cormorants and kittiwakes.

The disruption of Pelagic Cormorant nest-building by kittiwakes possibly selects for earlier building and laying peaks in the northern race over the southern, P.p. resplendens, even though the environment of the northern is more severe.

The plumage sequence and voice of the Yellow-footed Western Gull (Larus occidentalis livens) with comments on the taxonomic implications of these characters. RONALD R. LEVALLEY, Department of Biology, Humboldt State University, Arcata, California.

The Yellow-footed Western Gull has been considered a race of Larus occidentalis since first being described by Dwight in 1919. In 1925, Dickey and Van Rossem distinguished the Western Gulls in the Gulf of California as being an endemic, yellow-footed race, and predicted that the form would eventually be described as a distinct species. Since then few data have been gathered to support this thesis. This investigation is primarily concerned with an evident difference in the plumage sequences of the forms of Western Gull and dif-

ferences apparent in the voices of these forms. These characteristics suggest that the Yellow-footed Western Gull is specifically distinct from the pink-legged races of Larus occidentalis. Speculation concerning the ancestors of Larus occidentalis livens, using these characters, can now be discussed.

Intergradation between Western and Glaucous-winged Gulls. WAYNE HOFFMAN, JOHN A. WIENS, AND J. MICHAEL SCOTT, Department of Zoology, Oregon State University, Corvallis, Oregon.

Historical records indicate that Western and Glaucous-winged Gulls have occupied breeding ranges similar to their present ranges at least since 1900. Dawson (Birds of Washington, 1909) observed numerous birds of intermediate plumage. At the present time Glaucous-winged and Western Gulls are interbreeding, with varying frequency, from Yaquina Head, Oregon, north probably to the West coast of Vancouver Island. Hybirds are fertile and successfully reproduce.

The present study compares the morphology of the Western Gull population of the Farallon Islands, Calif. and the Glaucous-winged Gull population of the Chain Islands, off Victoria, B.C. with the morphology of the breeding colony on Destruction Island, in the area of overlap. The Destruction Island colony exhibits complete intergradation in morphology, which suggests that Western and Glaucous-winged Gulls should be considered conspecific. However, field studies indicate that mating patterns in the Destruction Island Colony are far from random, so that the specific status is questionable. Various species criteria are explored with references to this problem.

Movements and mortality in the Western Gull (Larus occidentalis) during the non-breeding season. MALCOLM C. COULTER, Genetics Group, University of California, Davis, California.

Banding returns of the Western Gull from different colonies along the Pacific coast of the United States were analyzed. Birds from the southern colonies were shown to have dispersive rather than migratory movements. There was a decline in dispersal tendency. Birds from the northern colonies moved farther than those from the southern colonies. Birds from Haystack Rock, the northernmost colony studied, showed age-specific dispersal tendencies, the younger birds moving farther. Mortality for the southern colonies was concentrated shortly after the breeding season; mortality for Haystack Rock birds was concentrated during the winter. These findings are related to increased demand on the environment and decreased carrying capacity of the environment at the end of the breeding season and during the winter. The situation is compared with that found in other species of gulls.

Nesting of Caspian Terns on Grays Harbor, Washington. GORDON D. ALCORN, Department of Biology, University of Puget Sound, Tacoma, Washington.

The life cycle including the nidology and oology of a colony on an island in Grays Harbor Co. in Washington will be presented. The colony is about 20 years old and shows quality of saturation in nesting habitat. A small spill-over occurred in the breeding season of 1974 that probably resulted from overpopulation on the main island. Brief remarks will be made concerning limited records of banded birds.

Biology of the Western Gull. RAYMOND PIEROTTI, Department of Natural Sciences, California State University, Sacramento, California.

While investigating the breeding behavior and ecology of the Western Gull on Southeast Farallon Island in 1973 and 1974, I became aware of a conspicuous sexual dimorphism. This dimorphism was primarily behavioral and ecological rather than morphological, even though there was significant evidence for the last as well. It appears that males and females have specific and well-defined roles in reproduction and parental care. In addition, there is considerable evidence to suggest that males and females exploit quite different food resources. Since to my knowledge this type of situation has never before been reported in larids, I feel this to be of significant interest. In addition, it may suggest methods by which sexual dimorphism may arise in more extreme forms.

Behavioral thermoregulation in the Noddy Term (Anous stolidus). ROBERT J. SHALLENBERGER, Hawaii Division of Fish and Game, Honolulu, Hawaii.

The Noddy Tern on Manana Island, Hawaii nests in large numbers under rigorous environmental conditions. Behavioral and physiological adaptations in both adults and chicks permit maximum utilization of available nest sites, despite high levels of insolation. This investigation examines the importance of color, age, and behavior in thermoregulation, as well as the role that and shade play in the survival of this species. The utilization of select microclimates is highly significant. Other selective factors are examined, particularly in reference to color of chicks. Field and laboratory data are presented on heating and cooling rates under variable environmental conditions.

The association of seabirds with the Arctic pack ice off Alaska. GEORGE J. DIVOKY, Division of Wildlife Research, U. S. Fish and Wildlife Service, Fairbanks, Alaska.

Observations in the Beaufort, Chukchi and Bering seas have shown that birds are more numerous at the ice edge than in the open water south of the pack. The apparent reason for this distribution is the concentration of organisms found at the ice edge. Plankton blooms in and under the ice support an under-ice fauna that is an important food source for certain Arctic seabirds. While birds are found at the ice edge throughout the year it is probably most important in winter when surface waters in the Arctic are severely depleted of organisms.

The Ivory Gull and Black Guillemot spend much of the year at the ice edge and are rarely found in pelagic areas away from the ice. Ross' Gull may also depend on the under-ice fauna for much of its food since it apparently winters in high Arctic areas feeding in leads in the ice. Species which utilize the ice edge but are also frequently found away from the ice include the Glaucous Gull, Glaucous-winged Gull, Slaty-backed Gull, Black-legged Kittiwake and Common and Thick-billed Murres.

Growth of captive juvenile murres. DAVID C. SMITH, International Bird Rescue Research Center, Berkeley, California.

Several orphaned juvenile murres (*Uria aalge*) were raised in captivity at the International Bird Rescue Research Center and measurements taken at irregular intervals. Growth curves are plotted for six separate parameters and attempts are made to match curves by adjusting their placement along the time axis. Comparisons with measurements of museum specimens allow crude estimations of absolute ages. The possibility that growth rates in the wild differ from growth rates in captivity could limit the utility of these measurements as tools for aging wild juvenile murres.

Oranochlorine residues in eggs of Alaskan seabirds. HARRY M. OHLENDORF, JAMES C. BARTONEK, ERWIN E. KLAAS, and GOERGE J. DIVOKY, Patuxent Wildlife Research Center, Laurel, Maryland, (Ohlendorf, Klass) and Northern Prairie Wildlife Research Center, Fairbanks Station, Alaska (Bartonek, Divoky).

Eggs of Double-crested Cormorant (*Phalacrocorax auritus*), Glaucous-winged Gull (*Larus glaucescens*), Black-legged Kittwake (*Rissa tridactyla*), Common Murre (*Uria aalge*), and Tufted Puffin (*Lunda cirrhata*) were collected from Shaiak Island and Round Island (northern Bristol Bay), Amalik Bay, and Bogoslof Island in 1973. These eggs were analyzed for organochlorine chemicals. Maximum values for each chemical were in eggs from Bogolof Island or Shaiak Island. The greatest amounts of DDE (11.2 ppm, wet weight) and PCB's (6.26 ppm) were in Glaucous-winged Gulls from Bogoslof Island. Tufted Puffins

had the greatest diversity of chemicals in their eggs. Kittiwakes had a lower DDE/PCB ratio than that in other species. Common Murres sometimes had greater amounts of hexachlorobenzene than of DDE or PCB's.

The significance of dredge spoil islands to colonially nesting waterbirds in certain national parks. P. A. BUCKLEY and F. G. BUCKLEY, National Park Service, North Atlantic Regional Office, Boston, Massachusetts.

The first complete censuses of all colonies of breeding waterbirds on Long Island, N. Y. and on the Outer Banks of North Carolina revealed the hitherto unappreciated significance of man-made dredge spoil islands as colony sites. Begun as studies of the waterbird avifaunas of four National Parks -- Fire Island National Seashore, Gateway National Recreation Area, Cape Hatteras National Seashore, and Cape Lookout National Seashore, -- censusing was expanded to place each of the parks breeding waterbird resources in regional perspective. It was then apparent that avian use of these islands -- up to 95% of all pairs of breeding birds were located on them in Cape Hatteras National Seashore in 1973 -- indicated an aggressive program of censusing, protection and management was needed. A series of recommendations based on our observations and on recent studies of spoil island ecology is made, applicable to most waterbird areas, and emphasizing the urgency of similar habitat-use tabulations on regional bases throughout the continent.

A pilot census of seabirds of New England. WILLIAM H. DRURY, Massachusetts Audubon Society, Lincoln, Massachusetts.

A pilot census of the seabirds breeding in New England was taken between 1971 and 1973. This survey included aerial estimates made in June, 1972 and surface counts made from boats or on the islands during all three years. Many other counts have been made between 1962 and 1969 in the course of numerous visits each year to about 30 islands during studies of Herring Gull reproduction. Some comments are made on the techniques used and the dependability of the data. The numbers of individual seabirds at an island vary within broad limits in response to events immediately around the island and on the feeding grounds. For ideal results consideration should be given to the tide and the state of the sea. Photographs should be taken not only to supply a rigorous count, but to provide a record which can be reprocessed later.

Alaskan pelagic bird observations and a data bank proposal. JAMES G. KING, GEORGE MARSHAL, JAMES H. BRANSON, FRANCIS H. FAY, and WILLIAM ALLEN, U. S. Fish and Wildlife Service, Juneau, Alaska, National Marine Fisheries, Washington, D. C.,

National Marine Fisheries, Kodiak, Alaska (Branson, Allen), and Arctic Health Research Laboratory, College, Alaska.

Simple instructions were developed for recording observations of birds from ships at sea. The method was followed on eight cruises in Alaskan waters by 13 observers of various levels of experience. Observations of 153,535 birds are diagrammed to show distribution and abundance by degree blocks of latitude and longitude and by seasons. It is concluded that a vast volume of data could be gathered by this method if a proper data bank were established. Such a data bank would be extremely valuable to resource managers and ornithologists.

Model estimation of energy flow in Oregon coastal seabird populations. JOHN A. WIENS and J. MICHAEL SCOTT, Department of Zoology, Oregon State University, Corvallis, Oregon.

A computer simulation model is employed to explore the patterns and magnitudes of population density changes and population energy demands in Oregon populations of Sooty Shearwaters, Leach's Storm-Petrels, Brandt's Cormorants, and Common Murres. The species differ in seasonal distribution and abundances, with shearwaters attaining high densities during their migratory movements through Oregon waters, and murres exhibiting the greatest seasonal stability in population numbers. On a unit area basis, annual energy flow is greatest to murre and cormorant populations, but because they occupy a larger area during their transit, shearwaters dominate the total energy flow through the four-species seabird "community".

Consumption of various prey types is estimated by coupling model output of energy demands with information on dietary habits. This analysis suggests that during a year murres consume nearly twice as many herring as any other prey type and consume relatively equal quantities of anchovies, smelts, cods, and rockfish. Cormorants consume a relatively small quantity of bottom-swelling fish, while storm-petrels take roughly equal quantities of euphausiids and hydrozoans. Anchovies account for 43% of the 62,500 metric tons of prey estimated to be consumed by the four species during a year, and 86% of this anchovy consumption is by shearwaters. The consumption of pelagic fish within the neritic zone by these four populations may represent as much as 22% of the annual production of these fish.

Distribution of seabird nesting colonies on the Washington Islands National Wildlife Refuge. ROBERT L. "REX" VAN WORMER, U.S. Fish and Wildlife Service, Boise, Idaho.

Seabird nesting colonies of the Washington Islands National Wildlife Refuge extend from Grays Harbor to Tatoosh

Island along the Pacific Coast of Washington. They involve 26 known nesting islands and over 750 small rocks that are used as loafing sites by adult breeding birds. Fourteen species of seabirds use these islands; however not all islands support all species of birds.

The refuge is divided into two sections with Destruction Island forming an imaginary center line. The division is based on variations in bird species with the dominant gull species being the apparent controlling factor. The south portion is dominated by surface nesting birds with Western Gulls while the north is predominately burrow building birds with Glaucous-winged gulls.

Ninety percent of all Common Murres nest on six islands approximately 16 miles south of Destruction Island. They share the crowns of the islands with mixed Western Gull-Double-crested Cormorant colonies while Pelagic Cormorants use the perpendicular faces. North of Destruction Island, Tufted Puffin, petrels and Cassin's Auklets use islands with sufficient soil cover for burrow building. The two petrel species are separated, Leach's on Carroll Island and the Fork-tailed Petrel on Bodelteh Island 13 miles further north. All islands or rocks with perpendicular faces support Pelagic Cormorants. Quillayute Needles contains a small Brandt's Cormorant colony. Black Oystercatchers and Pigeon Guillemot are scattered throughout the entire refuge.

Destruction Island contains both Western and Glaucous-winged Gull nesting colonies and an apparent growing colony of Western-Glaucous-winged hybirds. Other than gulls, the nesting population is restricted to burrowing birds; possibly because of the Glaucous-winged Gulls. It contains the only Rhinoceros Auklet colony in the Refuge, and the largest population of Black Oystercatchers as well as Tufted Puffin.

The breeding seabird resource in the Rat Islands, Aleutians with emphasis on the Alcidae. CLAYTON M. WHITE, Departent of Zoology, Brigham Young University, Provo, Utah.

The Rat Island group is situated in the west-central Aleutian Islands. It consists of nine major islands and one small pyramidal shaped rock; together they have about 325 miles of coastline while the largest island has about 106 miles. Estimates indicate about the following nesting densities: 250 fulmar, 2,500 cormorants, 6,500 gulls, 40,00 kittiwake, 30,000 murre, 630,000 auklets and 28,000 puffins. The islands will be discussed in terms of their physiography and major contribution to the seabird resource. Comparisons will be made with previous literature. Alcidae will be emphasized and the differential sizes of the colonies of various species on the various islands will be discussed. A new Red-legged Kittiwake colony on Buldir will be mentioned as will findings on plastic particles in auklet stomachs in this group of islands.

Monitoring overwater bird movements by radar. WARREN L. FLOCK. Department of Electrical Engineering, University of Colorado, Boulder, Colorado.

A number of radar systems operated by civil and military agencies provide coverage of coastal areas and allow monitoring of overwater bird movements. Many of the ACW radars and all of the DEW radars in Alaska are located along the coast and capable of monitoring overwater movements. Of special interest are the overwater flights between Asia and North America across the Bering Strait and the north-south migrations in the same area. The Tin City ACW radar is well located for monitoring these migrations. A radar at Ft. Lawton, Seattle gives excellent coverage of part of puget Sound. The Cape Charles, Virginia radar site is an example of one that provides good coverage of a portion of the Atlantic Coast.

Factors limiting the capability of monitoring overwater bird movements are the sea-clutter echoes and the limited range for low-flying birds. The sea-clutter echoes themselves are spiky and target-like and can be confused with bird echoes. The limited coverage from land-based radars can be extended by the use of shipborne radar. The conventional surveillance radar has at best only a very crude ability to identify birds as to type of size, but the recording of variations in the amplitude of the radar echo from a bird may allow such identification for a reasonable fraction of targets.

Proposed Alaskan seabird refuges. (slide presentation). EDGAR P. BAILEY, U.S. Fish and Wildlife Service, Anchorage Alaska.

Largely because of increased oil exploration and the tremendous additional tanker traffic which will occur after completion of the Trans-Alaska Pipeline, the Fish and Wildlife Service is focusing more attention on marine bird research and habitat preservation.

Approximately 48,000 acres of public lands and adjacent waters have been recommended to Congress as the Alaska Coastal National Wildlife Refuges. It is one of nine new refuge proposals under the Alaska Native Claims Settlement Act.

The Shumagin Islands, lying south of the Alaska Peninsula, have over a million birds, primarily murres, kittiwakes, puffins and cormorants. Marine waterfowl, sea otters, sea lions, and seals also inhabit the area.

The Barren Islands, north of Kodiak Island, are inhabited by puffins, murres, kittiwakes, Glaucous-winged Gulls, cormorants, and Parakeet Auklets. Shearwaters are abundant offshore.

Roughly, 2,000,000 seabirds nest at Capes Thompson and Lisburne, site of the proposed Chukchi Sea Refuge and the largest colonies along the Arctic coast. Murres, kittiwakes, Horned Puffins, and Glaucous Gulls are the primary species. Fairway Rock and Sledge Island, with an estimated 150,000 breeding pairs, will be added to the existing Bering Sea Refuge, and numerous islets and rocks are planned additions to the Kodiak Refuge.

Osteoarthritis in the Short-tailed Albatross: a crash-landing syndrome? STUART L. WARTER. California State University, Long Beach, California.

Aleut middens excavated on Amchitka Island in the Aleutian chain are rich in bones of seabirds. A high percentage of Short-tailed Albatross bones exhibit arthritic involvement of certain joints in the legs, hips, and shoulder girdle, or show evidence of other past traumatic injuries. Taken together these abnormalities might be interpretable as constituting a pattern resulting from stresses received upon hard landings and/or takeoffs. No similar phenomenon was noted among remains of other seabirds.

Systematic Observations of birds off the Washington Coast. TERRY WAHL, 3041 Eldridge, Bellingham, WA; and DENNIS PAULSON Burke Museum, University of Washington, Seattle.

A series of boat trips out of Westport, Washington, over the past 7 years has allowed us to assess some aspects of the distribution, abundance and seasonality of many species of pelagic birds out to about fifty miles offshore. These trips were concentrated in May and September but records are available from mid-April continuously through to mid-October. Although the collection of data was not as objective as that characteristic of many ocean cruises, primarily because we sought concentrations of birds, comparisons within our data are possible.

Most of the Procellariiformes can be found almost any time from May to October, but Buller's Shearwater moves into the area only from late August on and Leach's Storm-Petrel is usually found only in mid-summer.

Gulls, terns, jaegers and phalaropes are most abundant in spring and fall, as would be expected, but occasional individuals of these groups are encountered in mid-summer.

From our records, it would appear that September is the month of peak numbers of most species, and of birds in general, but this may be an artifact of our more frequent trips during that month. Most high counts of at least certain species (albatrosses, northern Fulmars, Flesh-footed and Pink-footed Shearwaters, many gulls) were associated with fishing boats, which attract many of these birds.

Bulletin Board

Translation Available

With the aid of student translators the paper by Claus Schönert entitled Zur Brutbiologie and Ethologie der Zwergseeschwalbe (Sterna albifrons albrifrons Pallas) [The breeding biology and ethology of the Little Tern (Sterna albifrons albifrons Pallas)] which appeared in Schildmacher, H., Beitrage zur Kennthis Deutscher Vogel, 1961: pp 131-187, has been translated into English. Copies are on deposit in the Van Tyne Library of the Wilson Ornithological Society at the University of Michigan and the reprint files of the ornithology departments of the American Museum of Natural History and the U.S. National Museum. Workers who are particularly interested in the biology and behavior of terns may obtain a xerox copy, at cost, by writing Dr. Charles T. Collins or Dr. Stuart L. Warter, Department of Biology, California State University, Long Beach, Calif. 90840.

Employment Opportunities

The U.S. Fish and Wildlife Service is undertaking several studies to assess populations, distribution, population dynamics, migration, trophic relationships, behavior, and critical habitats of marine birds as related to the U.S. Department of the Interior's plans for accelerated leasing of outer continental shelf for petroleum development in the Gulf of Alaska and in the Bering, Chukchi and Beaufort Seas. From April 1975 through at least September 1976 the Service will have need for several qualified temporary employees to assist project leaders and to conduct field studies with a degree of independency. Land-based studies will generally be conducted from late April through September; however, some will be conducted intermittently throughout the year. Shipboard studies and office-laboratory work will be conducted throughout the year. Studies will be conducted from offshore areas into and including littoral areas. In addition to those species and groups that are traditionally regarded as being "seabirds", waterfowl and shorebirds will be studied when in the marine environment. Persons wishing to be considered for temporary employment should complete a Civil Service Commission Standard Form 171 "Personal Qualifications Statement" (available at Post Offices) and write a letter stating periods of availability, any qualifications not listed on SF 171, specific interests and conditions of employment and send these to: Dr. Calvin J. Lensink, Activity Leader - Coastal Ecosystems, Biological Services, U. S. Fish and Wildlife Service, 813 D Street, Anchorage, AK 99501. The U. S. Fish and Wildlife Service is an equal opportunity employer.

Book Available

The new edition of the Hawaii Audubon Society's field guide, "Hawaiian Birds", will be available by 1 June. The book has been considerably revised and expanded to include new information and photos. Cost of the book is $2.50 and orders can be sent to Hawaii Audubon Society, P. O. Box 5032, Honolulu, HI 96814.

NEW MEMBERS

The following is a list of persons who have joined the PSG since Vol. 1, No. 2 of the Bulletin was issued. The list includes the member's occupation and interests and/or studies relating to seabirds.

A. Binion Amerson, Jr.
Environment Consultants, Inc.
14325 Proton Rd.
Dallas, TX 75240

Vertebrate Ecologist

Studies: Natural history of seabirds on central Pacific Islands.
Interests: Seabird ecology and ectoparasites. Island ecology and biogeography.

Robert T. Barrett
Marine Biological Station
N-9000 Tromso
Norway

Assistant in Marine Biology

Studies: Working on a graduate thesis on factors affecting breeding success of the Black-legged Kittiwake. Have worked on general census work on seabird colonies of northern Norway.

John Alexander Bartle
Flat 1
1 Allenby Tce.
Wellington 1
New Zealand

Scientist

Studies: Past work with breeding biology of Pterodroma pycroft:. Current work on seabirds in Cook Strait.
Interests: Breeding biology and population ecology of all Procellariiformes.

Alice Benedict
1411-1/2 High St. Apt. D
Bellingham, WA 98225

Graduate Student-Western Washington State College

Studies: Temperature regulation and enzyme adaptations in feet of Rhinoceros Auklets. Preliminary work on morphology of burrows of Rhinoceros Auklets.
Interests: Physiological adaptation to life in open sea and possible resultant specialization for life in specific areas.

Gerard Adrian Bertand, Jr.
Sea Grant Program
1800 University Ave.
University of Wisconsin
Madison, WI 53706

Biological Oceanographer

Studies: Zonation and distribution of seabirds on the central Oregon coast. Feeding habits of migratory seabirds.
Interests: Protection of coastal breeding areas from interference.

T. R. Birkhead
Edward Grey Institute
Dept. of Zoology
South Parks Rd.
Oxford OX1 3PS
England

Research Student

Studies: Population dynamics breeding biology and social behavior. Common Murre and other alcids on Skomer Island, South Wales.
Interests: Population studies, ecological segregation and social behavior.

Bayard H. Brattstrom
Dept. of Biology
California State University
Fullerton, CA 92634

Professor

Studies: Islas Revillagigedo, Mexico. Repopulation studies on San Benedicto Island after 1952 volcano. General natural history and ecology of sea and other birds on the other islands in the group. Socal behavior of seabirds.

Sherman D. L. Causey
Dept. of Population and Environmental Biology
University of California, Irvine
Irvine, CA 92664

Graduate Student

Studies: Socal behavior of Phalacrocoracidae and Haematopodidae.
Interests: Behavioral ecology of Pelecaniformes and Charadriiformes.

S. Conant
3663 Alani Dr.
Honolulu, HI 96822

Research Associate - Hawaiian IBP Project

Interests: Distribution and behavioral ecology.

John Cooper
Percy Fitzpatrick Institute of African Ornithology
University of Cape Town
Rondesbosch 7700
South Africa

Research Assistant

Studies: Thermoregulation, energetic growth, energy budgets of South African inshore birds (penguins, gannets, cormorants, gulls).

E. H. Down
"Grey Plovers"
Hendon Wood Lane
Mill Hill
London N.W.7
England

Company Director

Thomas J. Dwyer
U.S. Fish and Wildlife Service
Northern Prairie Wildlife Research Center
Jamestown, ND 58401

Wildlife Biologist

Interests: Reproductive strategies of alcids.

Todd Eberhardt
U. S. Fish & Wildlife Service
813 D. St.
Anchorage, AK 99501

Wildlife Biologist

Thomas and Caryn Eley
Dept. of Pathobiology
The Johns Hopkins University
615 North Wolfe St.
Baltimore, MD 21205

Graduate Student

Studies: Black Oystercatcher food habits in Humboldt and Del Norte Co., California. Ecto- and endoparasites of seabirds in Humboldt and Del Norte Co.
Interests: Ecology and behavior of seabirds and their parasites. Role of seabirds in marine ecosystems.

Erma J. (Mrs. Bradley) Fisk
Winter - 17101 SW 284 St.
Homestead, FL 33030
Summer - P.O. Box 308
South Orleans, MA 02662

Bird bander; Director, Natl. Audubon Society; Board member, Cornell Lab of Ornithology: Tern Warden, Cape Cod Natl. Seashore.

Studies: Distribution and protection of Least Tern and related colonies on the Atlantic Coast. Roof-nesting seabirds.

Warren Flock
Dept. of Electrical Engineering
Univ. of Colorado
Boulder, CO 80302

Professor

Studies: Radar studies of bird migration along coastline of Alaska.
Interests: Migration of eiders, Snow Geese, Black Brant, shorebirds and seabirds in general.

Glen A. Fox
Toxic Chemical Section
Canadian Wildlife Service
Environment Canada
Ottawa, Ontario
Canada

Biologist

Interests: Pollution effects in seabirds and relationships between Falco peregrinus peali.

Roger L. Gentry
Natl. Marine Fisheries Service
Marine Mammal Division
Sand Point, NSA Bldg. 67
Seattle, WA 98115

Wildlife Biologist and Animal Behaviorist

Studies: No formal studies but frequent contact with seabirds during research on seals.
Interests: Social behavior and ecology.

Harvey Gilston
Chemin des Mouettes 16
1007 Lausanne
Switzerland

Retired

Interests: Field identification and species habitats.

Tsuneyasu Hamanaka Research Institute of North Pacific Fisheries Faculty of Fisheries Hokkaido University Hakodate, Hokkaido Japan	Graduate Student Studies: Heavy metal concentrations in marine organisms, especially in alcids.
Murray D. Hansen 2183 Calle de Vida Tuscon, AZ 85715	Housewife Studies: Presently engaged in study of raptor migration routes (west of 100° meridian) Interests: Colony censusing and beached bird surveys.
M. P. Harris Institute of Terrestrial Ecology Hill of Brathens Banchory Kincardineshire AB3 4BY Scotland	Professional Ornithologist-Natural Environment Research Council Studies: Reasons for the decline in Common Puffin in Britain. The impact of tourism on seabird populations in the Galapagos. Interests: Ecology of seabirds in the widest sense - control of breeding and populations of tropical species.
Dennis W. Heineman 2609 Jaeger St. Bellingham, WA 98225	Biology Student-Western Washington State College Interests: Ecological isolating mechanisms. Resource partitioning, interspecific and intraspecific competition and general distribution of marine birds.
Yukio Higuchi Town Office 1657-7 Nagashima Kiinagashima-machi Kitamurogun, Mie Japan	Public Service Employee Studies: Life history of Japanese Murrelet. Interest: Conservation of Japanese Murrelet and other Pacific seabirds.
Hank Hosking 1000 South Hoyt Anchorage AK 99504	Fishery Biologist
W. J. Houck Biology Dept. Humboldt State University Arcata, CA 95521	Professor Interests: Systomatics and distribution.

Marshall A. Howe Natl. Fish & Wildlife Laboratory Natl. Museum of Natural History Washington, D.C. 20560	Ornithologist Interests: Behavioral ecology of breeding alcids, gulls and cormorants in mixed colonies.
Michael J. Jacobson U.S. Fish & Wildlife Service P. O. Box 1287 Juneau, AK 99802	Biologist Studies: Coastal zone studies in southeast Alaska.
Jorn Vestergaard Jensen Holtevej 13 DK-8000, Aarhus C Denmark	Interests: Primarily faunistic and ecological. Especially interested in the distribution of seabirds in the Mediterranean and off tropical west Africa.
Calvin J. Lensink U. S. Fish & Wildlife Service 813 D St. Anchorage, AK 99501	Wildlife Biologist-Activity Leader, Coastal Ecosystems Program, Fish and Wildlife Service, Alaska Studies: Bird populations of the Yukon Delta.
Bob Luterbach 2830 Lakeview Ave. Regina, Sask. S4S 1G5	Student Interests: Photography and conservation.
Peter F. Major Division of Natural Sciences Ap Sci. 151 University of California Santa Cruz, CA 95064	Graduate Student Studies: Flocking and predation in shorebirds Interests: Flocking, pelagic distribution in relation to meteorological and oceanographic conditions.
Mike and Diane McBride Kachemak Bay Wilderness Lodge China Poot Bay via Homer, AK 99603	Wilderness Lodge Owners and Managers
Malcolm E. McDonald Bear River Research Station P. O. Box 459 Brigham City, UT 84302	Wildlife Biologist Studies: Taxonomy and ecology of helminth parasites of waterfowl. Interests: Relation of parasitism to populations, disease and mortality of aquatic birds Maintain literature file on all parasites reported in aquatic birds in North America.

G. Victor Morejohn Moss Landing Marine Laboratories Moss Landing, CA 95039 and Biology Dept. San Jose State University San Jose, CA 95192	Professor Studies: Beached bird survey. Feeding habits of seabirds in Monterey Bay. Bi-monthly oceanic survey of pelagic seabirds in Monterey Bay. Fossil seabird avifauna of northern California. Comparison of avifaunal components of pre-Spanish times in California coastal Indian middens with present coastal avifauna.
E. Mortensen Klokkaragota 24 3800 Torshaun Faroe Island via Denmark	Baker Interests: Distribution population status and conservation.
Grace C. Nellis 20455 Cleo Ave. San Jose, CA 95129	Student
Tsuneo Nishiyama Research Institute of North Faculty of Fisheries Hokkaido University Hakodate, Hokkaido Japan	Research Associate in Ocean Ecology. Studies: Competition for food between seabirds and fish in the northern North Pacific Ocean and Bering Sea. Interests: Bioenergetics of seabirds.
David L. Olsen 9417 Athens, Rd Fairfax, VA 22030	Population Ecologist Studies: Worked on Hawaiian Islands Natl. Wildlife Refuge for five years.
Raymond Pierotti Dept. of Biological Sciences California State University Sacramento, CA 95819	Graduate Student Studies: Sexual roles in reproduction in the Western Gull. Breeding behavior of Pigeon Guillemots. Behavior of pinnipeds. Ecology of Western Gulls in different habitats.
Jim Rearden P. O. Box 313 Homer, AK 99603	Outdoors Editor, Alaska Magazine. Studies: Popular articles for magazines and newspapers. Interests: Member of the Alaska Board of Fish & Game. Formerly a biologist with Alaska Dept. of Fish and Game.

Robert Ricklefs Dept. of Biology University of Pennsylvania Philadelphia, PA 19104	Professor Studies: Energetics and development of young in Sooty Terns, Common Terns, Laughing Gulls and Leach's, Storm-Petrels.
William G. Roe 614 Willow St. Cranford, NJ 07016	Attorney Interests: Several pelagic trips and two summers in Alaska.
Robert P. Russell, Jr. 1020 Ashland Ave. Wilmette, IL 60091	Writer-Naturalist Studies: Orientation in relation to weather of Greater Shearwaters off southwest Ireland. Interests: Populations and feeding patterns off the continental shelves. Geographic distribution and limiting factors of alcids.
Fred B. Samson 205 Forest Resources Laboratory Penn State University University Park, PA 16802	Professor Interests: Ecological significance of colonial nesting in birds. Population dynamics of colonial nesting birds. Environmental pollution.
David Saunders Sunnyhill Rosemarket Milford Haven Pembrokeshire Wales England	Author and Lecturer Studies: Organizer of Operation Seafarer 1969, a survey of breeding seabirds conducted by the British Seabird Group. Coauthor of Seabirds of Britian and Ireland". Interests: Breeding distribution of North Atlantic seabirds. Man's exploitation of seabirds past and present.
Madeline Schouten 14916 Thrift Ave. White Rock, BC Canada	Physical Therapist Studies: Attempting to coordinate a beached bird survey. Pelagic trips. Interests: Teaching bird identification courses. Hoping to form a group of people who could assist in the event of a seabird disaster.
Elinor B. Seelye 2264 Del Norte St. Los Osos, CA 93402	Retired Interests: Conservation Chairman of Morro Coast Audubon Society.

Stan Senner c/o Fairbanks Environmental Center P. O. Box 1796 Fairbanks, AK 99701	Professional Conservationist
Ian D. Smith British Columbia Fish & Wildlife Branch Parliament Buildings Victora, BC	Inventory coordinator for B.C. Fish & Wildlife Branch
John Sproul, Jr. 226 Russell Lab University of Wisconsin Madison, Wisconsin 53706	Graduate Student Studies: Surveying PCB, DDE, and Dieldrin residues in Icelandic marine birds. Interests: Breeding and non-breeding distribution, habitat requirements and niche segregation.
Ronn Storro-Patterson Natural Environmental Studies UNEX University of California Berkeley, CA 94720	Professor Studies: Primary interest is with cetaceans. The field work for this provides the opportunity to work with seabirds. Interests: The associations of marine mammals and seabirds.
Lou Swenson 1527 Wintergreen St. Anchorage, AK 99504	
Richard R. Tenaza Dept. of Biological Sciences University of the Pacific Stockton, CA 95204	Professor Studies: Behavior and nesting success relative to nest location in Adelie Penguins. Study in progress on adaptations to cliff nesting in the Pelagic Cormorant. Interests: social communication. The ecology of social organizations and the evolution of behavior.
Atsuo Tsuji 568 Matoba Issha Idaka-cho Chikusa-ku Nagoya Japan	Mathematician Studies: Counting the number of shore-birds in migration on the wetland of Nabeta or Shiokawa. Interests: Protection of wetlands from reclamation projects.

Eric Tull c/o LGL #201 10110 124 St. Edmonton, Alberta Canada	Environmental Consultant Studies: Pelagic distribution of Atlantic seabirds. Murre mortality in salmon nets. Interests: Pelagic distribution and environmental problems as they relate to seabirds.
Masami Unemoto 2-32-2 Befu Settsu, Osaka Japan	Student Studies: Photographic work with seabirds.
Thomas Van't Hof Bird Division Museum of Zoology University of Michigan Ann Arbor, MI 48104	Research Assistant Interest: Behavior and egg temperature studies.
Kenneth L. Wilson 24 Hedgerow Lane Jericho, NY 11753	Student Studies: Black Guillemots at Kent Island N.B. Canada

PACIFIC SEABIRD GROUP

DEDICATED TO THE STUDY AND CONSERVATION OF PACIFIC SEABIRDS AND THEIR ENVIRONMENT

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1975

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